

WHAT IS CLAIMED IS:

1. A gas delivery system, comprising:
 - a gas ID, by which a gas supplied to the gas delivery system is identified;
 - a blender, blending oxygen and the gas to provide a gas mixture with a preselected oxygen flow rate;
 - an actuator, driving the blender into various blending positions according to the oxygen flow rate of the gas mixture, wherein the blending positions of the blender are corrected based on characteristics of the gas mixture; and
 - at least one flow sensor, to measure a flow rate of the gas mixture, wherein the flow sensor is corrected based on the characteristics of the gas mixture.
2. A gas ID, comprising:
 - a gas inlet, interlocking a gas source with a gas delivery system; and
 - an electrical circuit, connected to the gas delivery system to identify a gas supplied from the gas source.
3. The gas ID according to Claim 2, wherein the electrical circuit comprises a voltage divider, a resistor, across which a voltage drop is measured to identify the gas supplied to the gas delivery system.
4. The gas ID according to Claim 2, further comprising a lookup table in which a list of voltage drop values corresponding various gases is stored.
5. A blender, applied to a gas delivery system to blend a gas and an oxygen supplied therein, comprising a stepper motor driving the blender to various positions according to an oxygen flow rate of a mixture of the gas and oxygen, wherein the positions are calibrated based on characteristics of the gas.
6. The blender according to Claim 5; wherein the positions of blender driven by the stepper motor are calibrated according to gas constant and specific heat ratio of the gas.

7. The blender according to Claim 5, wherein the gas comprises a heliox.

8. A flow sensor, installed in a gas delivery system to detect a flow rate of a mixture of a gas and an oxygen delivered in the gas delivery system, wherein the flow sensor is calibrated according to temperature, humidity, barometer pressure and composition of the gas.

9. The flow sensor according to Claim 8; which is calibrated further according to viscosity of the gas when the flow rate is lower than a predetermined magnitude.

10. A ventilating system, comprising:

at least two gas inlets, with one inlet connected to an oxygen source and the other one connected to a gas source;

a gas ID, attached to the gas inlet connected to the gas source to identify a gas supplied therefrom;

a blender, blending the oxygen and the gas into a mixture, wherein the blender is driven by an actuator into various positions according to a selected oxygen flow rate of the mixture, and the blender positions are calibrated based on the specific heat ratio and gas constant of the gas;

an inspiratory circuit, on which an inspiratory flow sensor is installed, wherein the inspiratory flow sensor is calibrated according to temperature, pressure and humidity in the inspiratory circuit, and a gas constant of the gas;

a proximal circuit, through which a patient inhales and exhales, on which a proximal flow sensor is installed, wherein the proximal flow sensor is calibrated according to temperature, pressure, and humidity in the proximal circuit, and a gas constant of the gas; and

an expiratory circuit, on which an expiratory flow sensor is installed, wherein the inspiratory flow sensor is calibrated according to temperature, pressure and humidity in the inspiratory circuit, and a gas constant of the gas.

11. The ventilating system according to Claim 10, wherein a flow control valve is installed at the inspiratory circuit to adjust the flow rate according to reading of the inspiratory flow sensor.

12. The ventilating system according to Claim 10, wherein the inspiratory flow sensor, the proximal flow sensor and the expiratory flow sensor are calibrated further according to viscosity when the flow rate drops under a certain magnitude.

13. The ventilating system according to Claim 10, wherein inspiratory flow sensor, the proximal flow sensor and the expiratory flow sensor are calibrated based on a reference volumetric flow calculated at a body temperature, a gas constant of air, and a barometric pressure.

14. The ventilating system according to Claim 13, wherein the reference volumetric flow is pre-stored in a calibration table.

15. The ventilating system according to Claim 14, wherein the reference volumetric flow is converted from a volumetric flow calculated at 21% of oxygen, ambient pressure and temperature.

16. A method of correcting calibration of a blender applied to a gas delivery system, comprising:

calculating an oxygen flow rate in air as a multiplication factor of a blender position for air;

deriving a volumetric flow ratio of a gas supplied to the blender to the air; and

substituting the multiplication factor for air with a factor derived from the gas volumetric flow ratio of the gas, a volume fraction of oxygen in the gas, and an oxygen flow rate of the gas.

17. The method according to Claim 16, wherein the volumetric flow ratio is determined by gas constants and specific heat ratios for air and the gas.

18. A method of correcting calibrating of a flow

sensor, applying to a gas delivery system to deliver a gas mixture of a gas and oxygen, comprising:

deriving a standard volumetric flow for air with 21% of oxygen at ambient pressure and temperature;

converting the standard volumetric flow for air into a reference volumetric flow for air under body temperature and absolute pressure; and

multiplying the standard volumetric flow by a correction factor derived according to actual temperature, humidity, pressure and a gas constant of the gas applied to the flow sensor.

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